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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,106	12/15/2003	Takamasa Usui	04329.3196	4860

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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER

LOKE, STEVEN HO YIN

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/734,106	Applicant(s) USUI, TAKAMASA	
	Examiner Steven Loke	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-20 is/are pending in the application.
4a) Of the above claim(s) 6,7,9 and 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,8 and 10 is/are rejected.
- 7) ☒ Claim(s) 11 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, line 3, the phrase "a wire" is unclear whether it is being referred to the wire of claim 1.

Claim 3, lines 3-4, the phrase "the minimum distance in semiconductor device design rules" is vague and indefinite. The applicant never defines the boundary of the distance in the claim. Therefore, it is unclear what is the minimum distance in the semiconductor device design rules.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior art (figs. 18 and 20) (AAPA) in view of Umematsu et al.

In regards to claim 1, AAPA discloses a semiconductor device in figs. 18 and 20. It comprising: a semiconductor substrate [11]; at least one electrode pad [18] on which a wire [100] (fig. 20) is bonded, formed above the semiconductor substrate; a multilevel interconnection configuration [13] disposed between the electrode pad [18] and the semiconductor substrate [11], the multilevel interconnection configuration including a number of interconnection layers; a first insulating film [15] of low dielectric constant

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which is formed above the semiconductor substrate [11] to insulate the interconnection layers from one another.

AAPA differs from the claimed invention by not showing a dummy interconnection configuration formed at least within the first insulating film around the periphery of the electrode pad.

Umematsu et al. disclose a dummy interconnection configuration [28a, 30a, 32a] formed at least within the first insulating film [38a, 38c, 38d, 38e, 38g, 38h, 38i] around the periphery of the electrode pad [31] in figs. 3A and 3B.

Since both AAPA and Umematsu et al. teach a multilevel interconnection configuration formed under an electrode pad, it would have been obvious to have the dummy interconnection configuration of Umematsu et al. in AAPA because it prevents the outside moisture invading the interconnection configuration formed under the electrode pad.

Umematsu et al. further differ from the claimed invention by not showing the dummy interconnection configuration is formed in the shape of a ring around the periphery of the electrode pad.

It would have been obvious for the dummy interconnection configuration is formed in the shape of a ring around the periphery of the electrode pad because it depends on the shape of the wiring region.

In regards to claim 3, the combined device shows the distance between the dummy interconnection configuration and the multilevel interconnection configuration is set substantially equal to a distance.

In regards to claim 4, the combined device shows the dummy interconnection configuration comprises interconnection layers [30a, 28a] corresponding in number to the interconnection layers of the multilevel interconnection configuration [13] and vias ([14] of AAPA, [32a] of Umematsu et al.) which interconnect the interconnection layers.

In regards to claim 10, the combined device shows a portion of the dummy interconnection configuration (the entire dummy configuration except the top via [32a] in Umematsu et al.) is formed at least within the range of thickness of the insulating film of low dielectric constant.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (figs. 18 and 20) in view of Umematsu et al., further in view of AAPA (fig. 19).

In regards to claim 8, figs. 18 and 20 of AAPA differ from the claimed invention by not showing the first insulating film of low dielectric constant is 20 GPa or less in Young's modulus.

Fig. 19 shows the insulating films of low dielectric constant include SiOC having 20GPa in Young's modulus.

Since both figs. 18 and 19 teach an insulating film of low dielectric constant, it would have been obvious to have the SiOC low dielectric constant insulating film of fig. 19 in the device of fig. 18 because it can reduce the capacitance between the interconnection layers.

5. Applicant's arguments filed 4/26/05 have been fully considered but they are not persuasive.

It is urged, in pages 10-12 of the remarks, that the Examiner has not set forth an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification in claim 5. Umematsu et al. show a rectangular-shaped dummy interconnection configuration surrounds the rectangular wiring region [34] in figs. 3A and 3B. Since the shape of the wiring region can be in any shape, the shape of the dummy interconnection configuration would depends on the shape of the wiring region. The ring-shaped dummy interconnection configuration is just an example of the shape of the wiring region. Therefore, it would have been obvious to have the ring-shaped dummy interconnection configuration as claimed in claim 1.

6. Claim 2 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The additional major difference in the claims not found in the prior art of record is the dummy interconnection configuration is formed in a position corresponding to a displacement of the wire to be bonded to the electrode pad from the periphery of the electrode pad.

8. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (571) 272-1657. The examiner can normally be reached on 8:20 am to 5:50 pm.

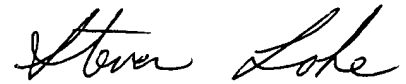
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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July 10, 2005

Steven Loke
Primary Examiner

A handwritten signature in cursive script that reads "Steven Loke". The signature is written in black ink and is positioned below the printed name and title.